REMARKS

Reconsideration of the application, as amended, and withdrawal of rejections of record, is respectfully requested.

35 U.S.C. 112

Unsigned declarations have been submitted by Paul Edward Cheeney, Andrew Sztehlo and Christopher Michael Sidebottom relative to the rejections. Signed declarations will be submitted as soon as they are received.

Claim 1 has been deleted and replaced by new claim 12 which is in Jepson claim format in an attempt to overcome the Examiner's objections under 35 U.S.C 112.

35 U.S.C. 103(a)

The Examiner has rejected claim 1 and 3-9 under 35 U.S.C. 103(a) as being unpatentable over either Clemmings et al. or Warren et al., each in view of WO 92/22581.

The present invention relates to the provision of frozen food products comprising AFPs. The product containing ice crystals which have an aspect ratio of greater than 1.9. Suitable anti-freeze peptides for inclusion in such frozen products provide an ice particle size upon recrystallization of less than 20μm as measured in accordance with example V.

The incorporation of AFPs into frozen food products, such as ice confections, was known before the priority date of the invention. The references cited by the Examiner are examples of such products.

However, all known products contained ice crystals having an aspect ratio of less than 1.9. The present invention provides the first teaching that it is possible to achieve frozen products comprising AFPs containing ice crystals having an aspect ratio of greater than 1.9.

The ability to provide ice crystals having such a high aspect ratio within a frozen food product containing AFP was totally unexpected.

To better illustrate that previous frozen products containing AFPs had an aspect ratio of less than 1.9, a number of compositions have been prepared containing the AFPs as disclosed in the prior art cited by the Examiner; namely Protein A-Saf 5 fusion protein as disclosed in Warren et al. (see the declaration from Sztehlo), and Type I AFP as disclosed in Clemmings et al. (see the declaration from Cheeney).

Further it can be seen from Figures 1 to 8 of Clemmings et al. that frozen products made by the process disclosed in Clemmings et al., are approximately spherical in shape (and thus must have an aspect ratio of much less than 1.9). Clemmings does not disclose the present invention.

The Examiner has also mentioned the document WO 92/22581.

WO 92/22581 discloses the isolation of anti-freeze polypeptides from the extracellular spaces of plant cells, said polypeptides being characterized by a specific molecular weight. Table 2 mentions a number of plants and provides a ranking of anti-freeze activity based on ice crystal morphology (i.e. the shape of the ice-crystal). The extracellular extract of Vinca Minor is indicated as of high antifreeze activity.

WO 92/22581 only relates to extracellular proteins. The applicants have found that proteins isolated from the extracellular extract, although according to WO 92/22581 possess antifreeze activity, do not provide an ice crystal size number average of less

than 20μm when tested according to the protocol given in Example V of the present application. However, a protein having a molecular weight of 32 kDa, which is not located in the extracellular spaces, does provide an ice crystal size number average of less than 20μm when tested according to the protocol given in Example V of the present application. This finding is illustrated in the Declaration from Sidebottom.

In summary the present invention is the first disclosure that it is possible to achieve frozen products comprising AFPs containing ice crystals having an aspect ratio of greater than 1.9.

The ability to provide ice crystals having such a high aspect ratio within a frozen food product containing AFP was totally unexpected.

Accordingly the invention meets the requirements of 35 U.S.C. 103(a).

In view of the foregoing amendments and remarks, early favorable action is solicited.

Applicants respectfully request the Examiner's consideration of documents submitted with a Supplemental Information Disclosure Statement mailed on March 23, 1998.

If a telephone conversation would be of assistance in advancing the prosecution of the present application, applicants' undersigned attorney invites the Examiner to telephone at the number provided.

Respectfully submitted,

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